

APPLICANTS REMARKS

STATUS OF THE CLAIMS.

Claims now in the application are 1-15, 17, 18 and 20-22. Claims 16 and 19 have been canceled in favor of new claims 21 and 22.

Claim Rejections – 35 USC § 112

Claims 16 and 19 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that the claims do not clearly set forth that the dienophile **mixture**s consist of from 0 to 25 molar percent of a maleimide with bismaleimides and/or trismaleimides.

Claims 16 and 19 have been canceled without prejudice in favor of new claims 21 and 22. To overcome this formal rejection, Claims 21 and 22 particularly point out that the dienophile can be a mixture of 0.0 to 25 molar percent of the maleimides with bismaleimides and/or trismaleimides as originally set-forth on page 12, lines 5-10 of the specification.

Double Patenting Rejections

Claims 1-20 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-33 of the Meador et al Patent No. 6,593,389. The Examiner states that although the conflicting claims are not identical, they are not patentably distinct because the instant polyimides correspond to the

polyimides derived from the photochemical cyclopolymerization of the aromatic diketones and dienophiles as set forth in Claim 1 and as claimed in the Meador et al patent.

While applicant does not agree with the Examiner on the obvious-type double patenting rejection, applicant is filing herewith a Terminal Disclaimer in compliance with 37 CFR 1.321 (c) to overcome the rejection; see *In re Vogel* 164 USPQ 619.

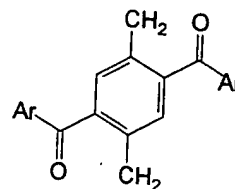
Claim Rejections Under 35 USC § 103

Claims 1-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the Meador et al publication titled “Diels-Alder Trapping of Photochemically Generated Dienes with a Bismaleimide: A New Approach to Polyimide Synthesis”. The Examiner states that the Meador et al publication discloses polyimides having repeating units analogous to the repeating units set forth in the claims of the instant application. The Examiner further states that the difference is the position of the Ar-C-OH group in relation to the phenylene ring in the repeating unit, and that it would have been obvious to one skilled in the art at the time the invention was made to provide polyimides having repeating units as set forth in the instant claims in view of the teaching of the Meador et al publication.

Applicant has carefully studied the Examiners rejection under 35 USC 103, and contends that the Meador et al publication fails to anticipate or even suggest the invention set forth in the instant claims, and therefore respectfully traverses the rejection for the following reasons.

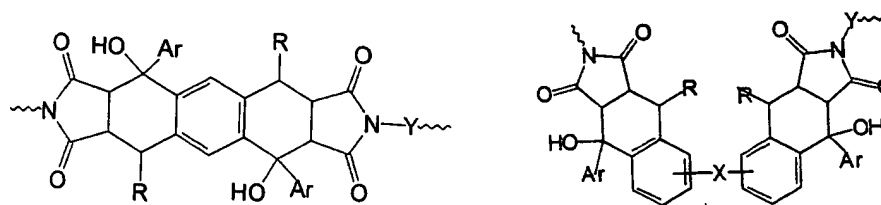
More specifically, the Meador et al publication only discloses Scheme 1. Scheme 1

is specific to the photochemical reaction of o-methylphenyl ketone in the presence of a bismaleimide to obtain the polyimide. Further, as shown at the top of page 8983 of the publication, the diketone (2,5-dibenzoyl-p-xylene) has the formula:



This diketone is photochemically cyclopolymerized with a dienophile e.g. bismaleimide to obtain the polyimide. The 2,5-dibenzoyl-p-xylene produces two photoenol moieties that undergo a Diels-Alder cycloaddition, and in the presence of bismaleimide provide the polyimides.

In comparison to the disclosure of the Meador et al publication (Scheme 1 on page 8983), the claims of this application particularly point out that the polyimides are derived from aromatic ketones and dienophiles that have specific repeating units selected from a Markush Group of seven (7) mutually distinct repeating units, see generic claim 1 of the instant application. As stated on page 13 lines 15-18 and on pages 4-16 of the specifications, each of the repeating units of the polyimides have a different formula i.e. (a) through (g), for example, see the following:



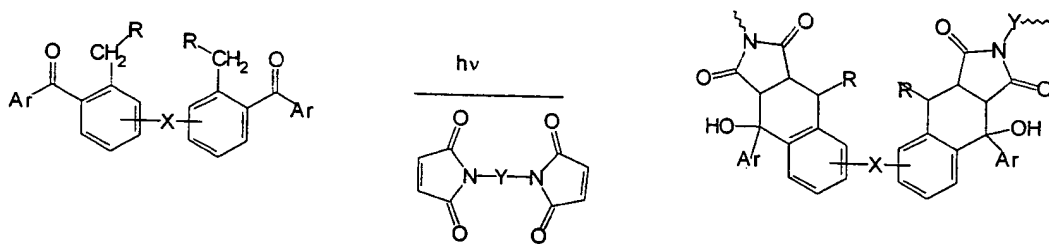
wherein R is selected from the group consisting of hydrogen, heteroaryl, and lower alkyl radicals of 1-8 carbons. It should be noted that R is in the 1,4 position (para) with respect to the aryl and hydroxy groups of all of the repeating units of the polyimides as set forth in the instant claims. In comparison, the Meador et al publication fails to disclose or even suggest the aromatic ketones shown by applicant on page 11 of the specification, or the photochemical polymerization of these specific ketones with the dienophiles to obtain the specific polyimides set forth in the claims and on pages 4-16 of the specification.

The Examiner admits that there is a difference between the Meador et al publication and the instant claims and that the difference is the position of the Ar-C-OH group in relation to the phenylene ring structure in the repeating unit. The Examiner concludes, however, that it would have been obvious to one skilled in the art to prepare polyimides having the repeating units as set forth in the instant claims in view of the Meador et al publication.

However, the Examiner is relying on the benefit of applicant's disclosure to conclude that it would have been obvious to use these specific diketones in a photopolymerization reaction to prepare the polyimides set forth in the instant claims. If the use of these specific ketones are known in the prior art for the preparation of polyimides by photocyclopolymerization with these dienophiles then that art should be made of record. The Examiner should not rely on applicant's disclosure to support the rejection; see *In re Horn* 203 USPQ 969. The suggestion and expectation of success of the specific reaction must be found in the prior art and not in applicant's disclosure; see *Auigen v. Chugai* 18 USPQ 2d 1016.

The Examiner further rejects species claims 1 through 14 stating that it would have been obvious to one skilled in the art to substitute a diketone containing the linking group phenyl-X-phenyl for the phenylene group in the specific diketones because the photoenol moieties upon photolysis would have been expected to take part in the polyimide as shown in Scheme 1. Again, at the time of the Meador et al publication, the reference failed to teach the photochemical cyclopolymerization of the specific aromatic ketones with maleimides or with mixtures of maleimides, particularly of the type set forth, for example, in claims 1-14 and on pages 11 and 14-16 of the specification.

For the reasons given above by applicant, the Meador et al publication fails to disclose, for example, a specific diketone having a formula:



wherein R is a radical in the 1-4 or para position with respect to the hydroxy and aryl groups. At the time of the publication, it was not known that these specific diketones, having the chemical structures set forth in the instant claims, would react with dienophiles or mixtures thereof to obtain polyimides in such good yields. Nowhere in the Meador et al publication is there disclosure of a photocyclopolymerization reaction with these specific diketones and dienophils e.g. with maleimide mixtures as specifically set forth in the claims of this application.

Applicant thanks the Examiner for the courtesy extended during a recent phone

interview in which the objection to the drawing (item 10 of the Summary) was discussed and withdrawn by the Examiner.

CONCLUSION

Original claims 16 and 19 have been canceled. New claims 21 and 22 are submitted to overcome the formal and prior art rejections. It is Applicant's contention that all the claims 1-15, 17, 18 and 20-22 are now in condition for allowance, and therefore the Application should pass to issue. An early action to this effect is earnestly solicited.

Respectfully submitted,

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